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Ashland Traffic Impact Fee
Assessment Procedure

MAPC
Metropolitan Area
Planning Council
110 Tremont Street
Boston, Massachusetts 02108

April 1987

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The short term assistance project documented here was financially supported by the Massachusetts Department of Public Works (Contract #23892) and the Urban Mass Transportation Administration (Contract #MA-08-0126 and MA-08-0135).

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INTRODUCTION

The Town of Ashland is faced currently with a substantial number of residential development proposals concentrated along two narrow, substandard streets (Map 1). The town, being concerned about providing for the general health, safety and welfare of its residents in this area, has requested that the developers contribute to the off-site road improvements that will serve these developments.

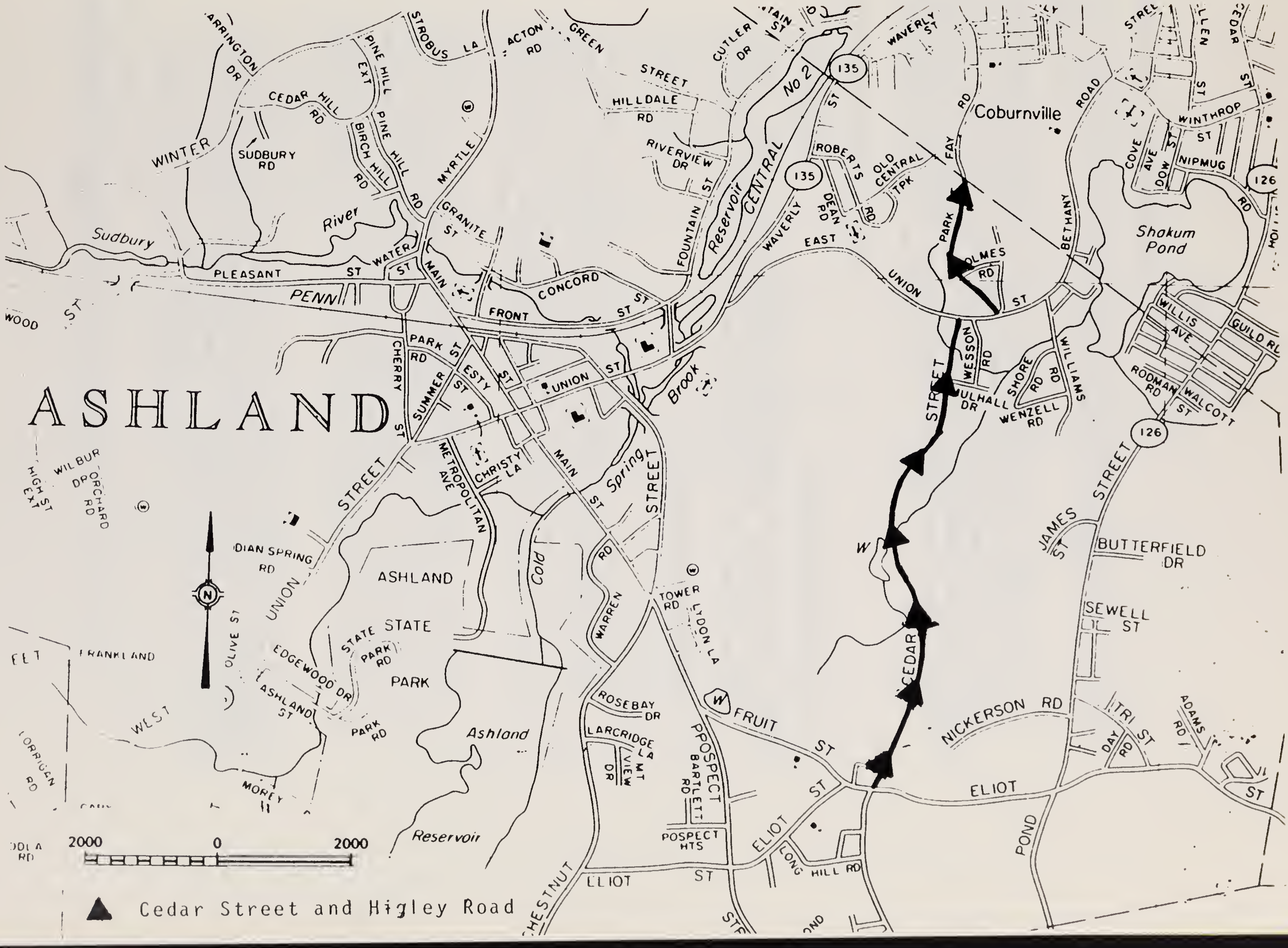
To determine the "fair share" for these proposals, the Town of Ashland turned to the Metropolitan Area Planning Council to help develop an impact fee allocation technique for improvements to Cedar Street and Higley Road. While it is acknowledged that the developments may impact other areas, Ashland's request was restricted to measuring only the immediate traffic impacts of each development.

The analysis conducted by the MAPC is similar to the method discussed in the December 1986 ITE Journal article "A Procedure for Allocating Road Improvement Costs to Private Developers," and to methods used in Montgomery County, Maryland and various locations in Florida. Adaptations to the methods were made to address the specific needs of the Town of Ashland.

The analysis determines the roadway's length, existing traffic volumes, the development potential, projects new design capacity, and estimates the cost of reconstruction. These data are then used to determine an assessment rate (dollars per housing unit) that represents the fair share costs associated with the benefits derived by new development.

The study is based on the average cost for roadway construction projects in Ashland. The town will need to adjust the figures in this report to reflect the actual cost of road construction.

MAP 1
Locus Map



CEDAR STREET

I. Description of the Corridor

Cedar Street is a narrow, winding roadway connecting Eliot Street and East Union Street in Ashland. The road has the potential to parallel Route 126.

Cedar Street is 7400 feet long, from Eliot Street to East Union Street. The Middlesex County Engineer reports that the road width varies from 15 feet to 23 feet, with the average being less than 20 feet wide. The 15-foot wide sections of this two-way suburban roadway under most guidelines would be considered substandard and a potential public safety hazard (see Figure 1).

II. Existing and Potential Use

A. Existing Use — 1,216 vehicles per day

In July 1986, the Massachusetts Department of Public Works (MDPW) conducted traffic counts along Cedar Street in Ashland. MDPW reported 1,216 vehicles used the street on an average weekday.

B. Potential Use — 1,740 round trips per day

The Town of Ashland faces a building boom along Cedar Street. At present, 791 new units of housing have been proposed and/or approved by the planning board. An additional 176 units of housing on the street are possible under current zoning. Current and potential development intensity have created the need for roadway improvements.

Using data listed in the Workman's Circle FEIR[1], prepared by Diversified Engineering Services of Boston in May 1985, which will add 684 condominium and single family housing units, it is estimated that the Cedar Street project will add 325 vehicle round trips to Cedar Street each weekday. The development is also accessed via Pond Street which spreads traffic impacts to adjacent streets.

One hundred and seven new housing units on Cedar Street have been proposed by two developers. Using factors from the I.T.E. Trip Generation Manual these developments would add 535 vehicle round trips each day on Cedar Street. If the vacant land was developed to the full build-out potential (another 176 housing units), 880 vehicle round trips can be expected.

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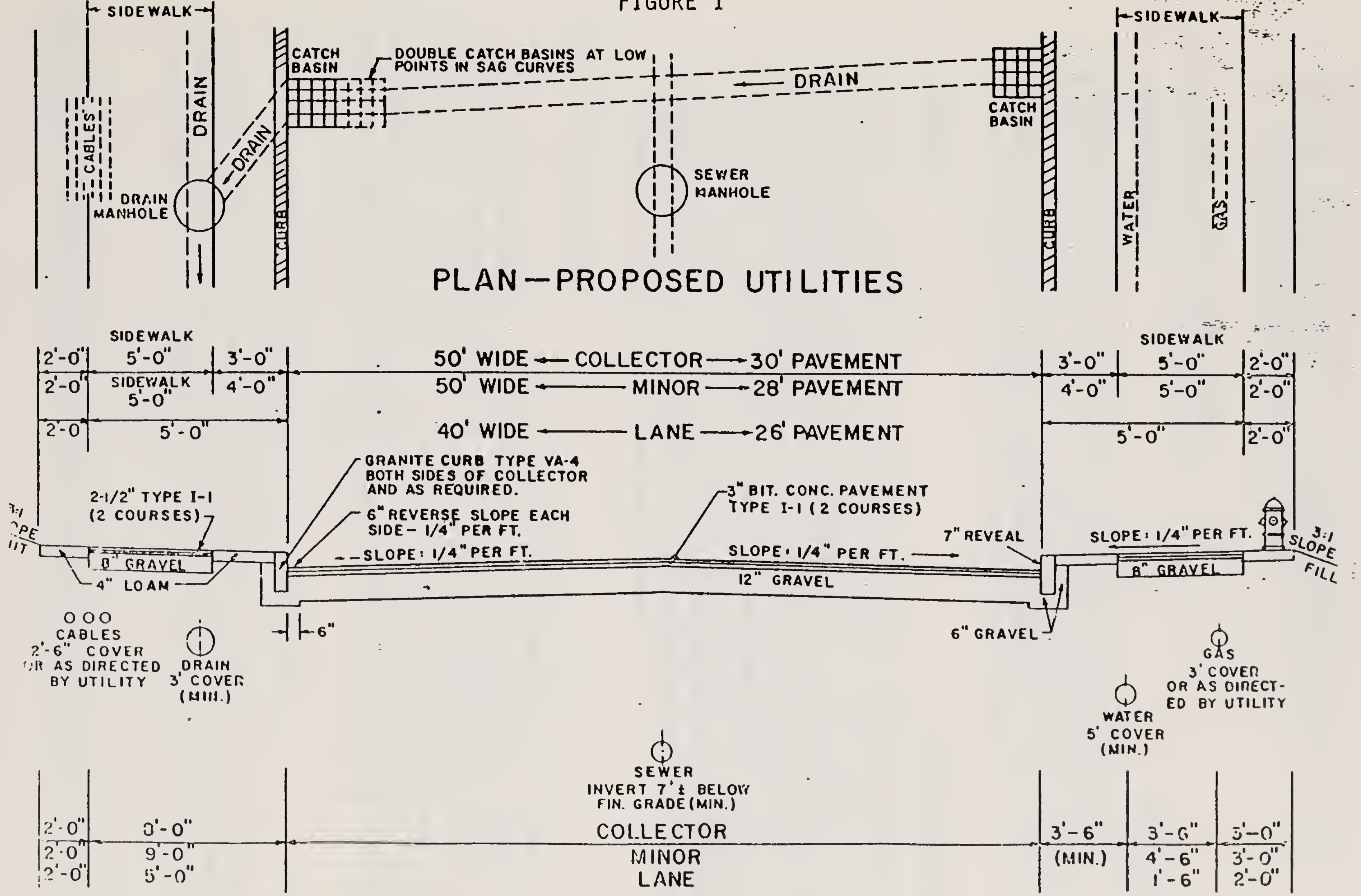
[1] The Workman's Cirlce FEIR was an impact report required by the Massachusetts' Environmental Protection Agency.

FIGURE 1



PLAN—PROPOSED UTILITIES

TYPICAL STREET CROSS SECTION

SOURCE: Rules and Regulations Governing the Subdivision of Land, Town of Ashland, Massachusetts, Amended July 1, 1983.

The total traffic impact of these projects will be 1740 new round trips per day on Cedar Street, or a potential 3480 trips per day. (Based on the ITE Trip Generation Manual average 10 trip ends or five round-trips per single family.)

III. Planned Improvements and Capacity

A. Improvements — 28 foot wide road

Ashland officials requested the Middlesex County Engineer to study Cedar Street to determine the necessary roadway improvements. The preliminary study calls for a 28-foot-wide pavement including 2 two-foot paved shoulders, curbs and sidewalks. This design would follow the minor roadway cross section in Figure 1.

B. Capacity — 11,200 vehicles per day

The above improvements to Cedar Street should provide capacity for approximately 11,200 vehicle trips per day. This number is derived using the 1985 Highway Capacity Manual.[2] The 11,200 vehicle trips per day is computed using a Level of Service "D," a high-density traffic condition, an observed peak hour (5-6 p.m.) traffic volume that was 12% of the daily traffic volumes, and the maximum annual average daily traffic for two-lane rural highways according to the 1985 Highway Capacity Manual. A daily vehicle trip standard was selected instead of a peak hour standard, because it was determined more representative of residential demand on the roadway network.

IV. Cost of Improvements — $1,850,000

A conservative estimate for the roadway improvements discussed in Section III, using construction costs typical in Ashland would be about $250 per linear foot, excluding right-of-way costs. To determine a cost figure for this project, MAPC reviewed cost figures ranging from $40 per linear foot to $500 per linear foot. The fee should be recalculated when actual improvement costs are determined. As previously noted Cedar Street is 7400 feet long (1.4 miles) from Eliot Street to East Union Street. The estimated project cost is $1,850,000.

V. Allocating Costs to Developments and to the Town

The following process has been developed for the Town of Ashland's use to determine fair share costs associated with specific corridor growth and general benefit to the community.

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2. 1985 Highway Capacity Manual, Transportation Research Board, 1985, Table 8-10.

A. Calculate Use of the Roadway by New Traffic from Developments — 31.1%

In this step, the portion of roadway capacity and traffic generated by new development in the corridor are determined. This process will use the capacity for 1 lane, 5600 vehicles (11,200/2), and the number of round trips generated by development (1740 round trips), to determine the use ratio by new traffic from development on the improved road.

$$\text{Use Ratio (U)} = \frac{\text{New Trips from Development (T)}}{\text{Expanded Road Capacity}}$$

$$= \frac{1740}{5600}$$

$$= 0.311$$

B. Estimate New Development & Town's Respective Share of Road Improvement Costs

New Development Share = $575,350
Town's Share = $1,274,650

It is necessary to develop estimates of road improvement costs associated with the benefits accruing to new development in the corridor and to the town.

New Development Share (DS) = Use (U) x Project Cost (PC)
= 0.311 x $1,850,000
= $575,350

Town Share (TS) = PC - DS
= $1,850,000 - $575,350
= $1,274,650

Note that the town assumes the residual cost of the project, given that the town has the facility.

C. Determine Cost Per-Vehicle Round Trip Generated By New Corridor Development — $330.66 per round trip

To determine the cost per unit of housing for project associated costs, first determine the cost for each round trip using the corridor associated with new development. This is accomplished by dividing the new development share by the number of new development related trips to be added to the corridor (See Appendix A for further discussion of impact fee determinations.).

New Development Related Cost Per Vehicle Round Trip $= \frac{\text{New Development Share (DS)}}{\text{Trips (T)}}$

$= \frac{\$575,350}{1740}$

= $330.66/round trip

D. Determine "Fair Share" For Each Dwelling Unit — $1,653.30 per unit

In order to determine the "Fair Share" for each dwelling unit to be developed in the corridor, multiply the development related cost per vehicle trip by 5. (See Page 3, Section IIB)

Cost per Dwelling Unit = New Development Share x 5
= $330.66 x 5
= $1,653.30

Note: The Workman's Circle project has access to both Cedar Street and Pond Street. Since the development traffic will be split between the two access drives on two streets, this cost per dwelling unit will not represent the "fair share" associated with the development. For Workman's Circle share of improving Cedar Street, multiply the new development related traffic assigned to Cedar Street by the cost per vehicle round trip, i.e. $330.66/vehicle-round-trip multiplied by 325 round trips (as stated in the Workman's Circle FEIR) would equal $107,464.50.

HIGLEY ROAD

I. Description of the Corridor

Higley Road is a narrow winding roadway connecting East Union Street in Ashland with Route 135 in Framingham. The road serves as a short-cut for traffic from the Cedar Street area to Route 135.

Higley Road is 2200-feet long in Ashland and varies in width. The Middlesex County Engineer reports that the road width varies from 10 feet to 17 feet, with the norm being 12 feet wide. The road under any guidelines would be considered substandard, impassable during winter months, and a potential public safety hazard (see Figure 1).

II. Existing and Potential Use — 741 vehicles per day

A. Existing Use

The Massachusetts Department of Public Works reported in July 1986 that 741 vehicles use Higley Road on the average weekday. However, town planner Steven Kerlin reported that most times in December 1986 and January 1987, the roadway was impassable.

B. Potential Use — 1,262 round trips per day

At present, 30 new units of housing for Higley Road have been proposed and/or approved by the planning board. Under current zoning, at full build-out, an additional 44 units of housing are possible on the land served by the street. This intensity of development, plus development planned along Cedar Street and East Union Street has created the need for roadway improvements. Using the I.T.E. Trip Generation Manual data, Higley Road developments would add 740 vehicle round trips each day to Higley Road.

In addition, an estimated 30% of new Cedar Street development-related traffic will use Higley Road.[3] This would add an additional 522 new vehicle trips to Higley Road.[4]

The total traffic impact of these projects will be 1,262 new round trips per-day on Higley Road, or a potential 2,524 trips per day.

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[3] Based on analysis of traffic data available from MDPW and the Workman's Circle FEIR.

[4] Analysis of the flow of traffic in the vicinity of Higley Road and Cedar Street does not reflect the use of Cedar Street by development on Higley Road.

III. Planned Improvements and Capacity

A. Improvements

28 foot wide road

The Town of Ashland requested the Middlesex County Engineer to study Higley Road to determine the necessary roadway improvements. The preliminary study calls for a 28-foot-wide pavement including 2 two-foot paved shoulders, curbs and sidewalks. This design would follow the minor roadway cross-section in Figure 1.

B. Capacity

11,200 vehicles per day

The improvements to Higley Road are similar to those of Cedar Street discussed above. This should provide capacity for approximately 11,200 vehicle trips per-day on Higley Road.

IV. Cost Improvements

$550,000

A conservative estimate for the roadway improvements discussed in Section III would be about $250 per linear foot. As noted, Higley Road is 2,200 feet long (.4 mile) from East Union Street to the Framingham town line. An estimated project cost is $550,000.

V. Allocating Cost to Developments and to the Town

The process discussed for Cedar Street has been applied to Higley Road to determine fair share costs associated with the corridor's new development and the general benefit to the community.

A. Calculate Use of the Roadway by New Traffic from Developments

22.5%

$$\text{Use Ratio (U)} = \frac{\text{New Trips from Development (T)}}{\text{Expanded Road Capacity}}$$

$$= \frac{1262}{5600}$$

$$= 0.225$$

B. Estimate of New Development & Town's Respective Share of Road Improvements

New Development Share = $123,750
Town's Share = $426,250

New Development Share = Use (U) x Project Cost (PC)
= 0.225 x $550,000
= $123,750

Town Share (TS) = PC - DS
= $550,000 - $123,750
= $426,250

C. Determine Cost Per Vehicle Round Trip Generated by New Corridor Development — $98.06 per round trip

New Development Related Cost Per Vehicle Round Trip = New Development Share (DS) / Trips (T)

= $123,750 / 1262

= $98.06/round trip

D. Determine "Fair Share" for Each Dwelling Unit Built Cedar Street — $147.09 per dwelling unit

Cost per Dwelling Unit = New Development Share x 5 round trips
= 98.06 x 5
= $490.30/Dwelling Unit

E. Determine "Fair Share" for Each Dwelling Unit Built on Cedar Street — $147.09 per dwelling unit

As discussed above, an estimated 30% of Cedar Street's new development related traffic will use Higley Road. Since all housing units are anticipated to generate the same number of trips, new Cedar Street dwelling units will add 30% of the traffic a new Higley Road dwelling unit will add to Higley Road. Thus:

New Cedar Street Development Share of Higley Road Improvements = Cost per Dwelling Unit x 0.3

= $490.30 x 0.3
= $147.09/dwelling unit

Note: For Workman's Circle share of improving Higley Road, multiply the new development related traffic assigned to Cedar Street by 30% and by the cost per vehicle round trip, i.e. $98.06/vehicle-round-trip multiplied by 325 round trips multiplied by 30% would equal $9,560.85.

SUMMARY

The previous analysis documents per dwelling unit fees for new developments in Ashland on Cedar Street and Higley Road. Cedar Street development will pay an assessment fee of $1,653.30 per new dwelling unit for improvements to Cedar Street and $147.09 per dwelling for improvements to Higley Road, a total fee of $1,800.39 per dwelling unit. Higley Road development will pay an assessment fee of $490.30 per new dwelling unit for road and other improvements to Higley Road.

Due to the special circumstances of the Workman's Circle development, the fair share improvement costs to be assessed to this development were calculated separately. Workman's Circle share of Cedar Street improvements would be $107,464.50 and $9,560.85 of Higley Road improvements. This is a total fee of $117,025.35 ($171.09 per unit).

The developer of Workman's Circle has agreed, as a part of its special permit for a multi-family develoment, to regrade and repave Cedar Street from Eliot Street to the furthermost property line of the development to the width of 28 feet. Given the timing of the Workman's Circle project, now entering its second year of construction, and the special needs created by the project for immediate safe access, the developer should be held to this agreement. For Ashland to raise the $1,274,650 in one year (the town's share of the Cedar Street improvements), would place a severe burden on the community's capital budget. It is likely that the town will require several years to set aside this sum.

Appendix A

It is possible to more accurately assess the benefits a specific development receives from a road improvement project by identifying major destinations, directional biases of traffic and the distance vehicles will travel along a corridor. This type of analysis would require separate calculations for each development within the corridor to determine site-specific fees. This type of an analysis is used for a "variable-fee" system. Variable-fee systems are usually more expensive because they require separate calculations.

The needs of the Town of Ashland are better served by the use of a "flat rate" fee system. This type of impact fee system creates a fee schedule for various land uses based on unit costs. The only information necessary to determine a development's fair share is the number of units in the project. This type of fee system is simpler and less costly to implement.